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# A NEW MARKET FOR COFFEE

by CAROL WAHL

The coffee plant is best known for its bean, which, when roasted, ground and brewed, makes one of the most widely consumed infusions in the world. But the celebrated and commercially lucrative bean is literally surrounded by substances that are usually discarded as waste products during processing. In fact, the principal waste product, coffee pulp, is produced in such abundant quantities that it poses a pollution problem. Recent studies reveal, however, that this waste product is an excellent fertilizer and a source of food for farm animals, and could have as much economic impact as the coffee bean itself.

In 1971, a comprehensive research program on coffee pulp was begun by the Division of Agriculture and Food Science of the Nutrition Institute of Central America and Panama (INCAP), with headquarters in Guatemala, and was later financially backed by the Canadian-based International Development Research Centre (IDRC). Although not conclusive, the results of this study -- soon to be published in Spanish and English by IDRC -- present a truly promising outlook for this agricultural by-product.

Coffee pulp is a thick layer (5 mm) of spongy cells that surround the coffee bean on the coffee fruit. It is the first by-product obtained in processing and is equivalent to 29 percent dry weight of the entire fruit. But the water content of this substance -- between 60 and 80 percent -- constitutes a major stumbling block to its full utilization because when used fresh, it is costly to transport, handle and process.

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The feasibility of incorporating coffee pulp into animal rations is increased by two factors. First, a lengthy, seven-month coffee harvesting season assures a ready and plentiful supply. Secondly, the pulp is a good source of nourishment for animals as it contains important quantities of raw protein and nitrogen, and is as rich in these essential elements as cotton or soy flour. Also present in the pulp are raw fibres, ash, potassium, carbohydrates, fats and other organic compounds such as caffein and tannins.

After conducting long and varied feeding experiments on several types of animals using different amounts of coffee pulp, processed in different ways, INCAP researchers conclude that coffee pulp can be used successfully in the raising of cattle, pigs and even fish. The only farm animal that had an overtly negative reaction to this substance was the chicken.

Despite the encouraging outcome of research on the use of coffee pulp in animal feed, researchers have discovered certain limitations. One of them is that the poor palatability of this by-product results in reduced feed consumption as compared to normal rations. and consequently in reduced weight gain in animals. This problem can be somewhat remedied by mixing sugarcane molasses or grass with the pulp.

Experiments have also shown that the amount of pulp that can be used in animal feed without producing toxic effects (weight loss, sores on the skin, hair loss, etc.) differs for each species according to their level of tolerance. These adverse reactions are believed to be caused by the caffein and tannins present in the pulp. More research is needed to determine the precise mechanisms involved in these negative reactions and to find the means of eliminating them. One possibility, say the researchers, is to extract these toxic substances from the pulp. If done on an industrial scale, these compounds could be used as raw materials for other industries.

In addition to its potential as a source of animal feed, coffee pulp has proved to be a good fertilizer. It is often employed as such in the coffee plantations where it accumulates after processing. Thus far, results using this fertilizer have been positive, but further work is needed in order to determine how this substance could be exploited on an industrial and commercial scale.

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The rational use of this by-product could have far-reaching social and economic implications. For instance, the use of all parts of the coffee plant, and especially the pulp, would make the coffee industry more coherent, integrated and efficient. Even more important, the use of coffee pulp could have tremendous impact on a serious problem currently afflicting some developing countries: the competition between man and animal for the same food. As the ingredients for animal feed -- mainly grains and other food crops such as cassava -- become scarcer, the price of feed is skyrocketing. Coffee pulp, which is not suitable for human consumption but which is usable in animal feed, could help free urgently needed food to feed an ever-increasing human population.

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